Sara Brown

Chapter 21: Developing Concepts of Data Analysis

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| **Representative TN State Curriculum Standards**  Fourth Grade  **Grade Level Expectations:**  GLE 0406.5.1 Collect, record, arrange, present, and interpret data using tables and various representations.  **State Performance Indicators:**  SPI 0406.5.1 Depict data using various representations (e.g., tables, pictographs, line graphs, bar graphs).  SPI 0406.5.2 Solve problems using estimation and comparison within a single set of data.  SPI 0406.5.3 Given a set of data or a graph, describe the distribution of the data using median, range, or mode.  Fifth Grade  **Grade Level Expectations:**  GLE 0506.5.1 Make, record, display and interpret data and graphs that include whole numbers, decimals, and fractions.  **State Performance Indicators:**  SPI 0506.5.1 Depict data using various representations, including decimal and/or fractional data. | |
| Chrysanthemum.jpg | Time: 10 minutes   * First I will read *Chrysanthemum* aloud to students. * After reading the book, I will ask students if they noticed all of the different names besides Chrysanthemum. Then I will ask the students how many letters are in their name. * Then we will list the number of letters in the students’ first names and find the mean. * Finally we will add in Chrysanthemum and see how it changes the data |

**Virtual Manipulatives**

Time: 5 minutes

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| **Mean, Median, and Mode Game**  This interactive game allows students to manipulate buildings to put them in order and answer different questions. Students will use this to find the mean, median, and mode.  <http://www.kidsmathgamesonline.com/numbers/meanmedianmode.html> |
| **BAMZOOKi: Median, Mode, Mean, and Range**  The BAMZOOKi Zooks are loose. You must sort the averages before the lair becomes overrun.  <http://www.bbc.co.uk/schools/ks2bitesize/maths/data/mode_median_mean_range/play.shtml> |

**Part I: Activities from the textbook**

Materials needed: prepared scatter plots, uncooked spaghetti noodles, tape, pop-cubes/connecting cubes, a variety of toys, strips of drawing/construction paper, rulers, and sticky notes.

1. **Activity 21.4: Best-Fit Line, Pg. 448-** 5 minutes

Topic: Best-Fit Line

Have students collect data and prepare a scatter plot, or use an already prepared scatter plot. Give each student an uncooked piece of spaghetti to use as a line. The task is to tape the line on the plot so that it is the “best” line to represent the relationship in the dots. Students should develop a rationale for why they positioned the line as they did and be able to explain why. Compare lines chosen by various groups and their rationales.

1. **Activity 21.5: Leveling the Bars, Pg. 450-** 10 minutes

Topic: Finding Mean/Average

Have students make a bar graph of the data in Figure 21.15 using plastic connecting cubes. Students will then use the graph to determine what the price would be if all of the toys were the same price, with the total remaining the same. Students will use various techniques to rearrange the cubes in the graph but should eventually create six equal bars; there may be a few leftovers which can be distributed as fractions or decimals.

1. **Activity 21.6: The Mean Foot, Pg. 450-** 10 minutes

Topic: Finding Mean/Average without “crunching” numbers

I will ask the question, “What is the mean length of our feet in inches?” Each student will cut a strip of paper that matches the length of his or her foot. Students should write their names and the length of their feet in inches on the strips. Before finding a mean for the class, you may want to get means for smaller groups first. Place students in groups of four, six, or eight. (Groups of five or seven will prove to be problematic.) In each group the students will tape their foot strips together, each group should come up with a method of finding the mean without using any of the lengths written on the strips; they can only use the combined strip. From doing this, they will devise a method for determining the mean for the whole class.

1. **Activity 21.7: Finding the Balance Point, Pg. 451-** 5 minutes

Topic: Mean

Have students draw a number line from 0 to 12 with about an inch between the numbers. Use six small sticky notes to represent the prices of the six toys from Figure 21.17. Students will place a light pencil mark on the line where they think the mean might be. Avoid the add-up-and-divide computation. Students will determine the actual mean by moving the sticky notes toward the “center”. In doing this, the students will find out what price or point on the number line balances out the six prices on the line. For each move of a sticky note one space to left (a toy with a lower price), a different sticky note must be moved one space to the right (a toy with a high price). Eventually, all sticky notes should be stacked above the same number, balance point, or mean.

**Part II: Lesson Plan**

Jumping Jack Math

<http://illuminations.nctm.org/LessonDetail.aspx?id=L865>

Students will collect and prepare jumping jack data to send to officials on planet Jumpalot. Each student will record how many jumping jacks they can do in 10 seconds and convert that into how many they could do in a year. Students will then use that data to find the mean, median, and mode. Students will also notice the effects that extreme numbers will have on the set of data. Finally, have students brainstorm what advantages and disadvantages using mean, median, and mode can have.